APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,045	10/29/2003	John T. Coffey	TI-35975	5845

23494   7590   05/24/2007

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EXAMINER
PHU, PHUONG M

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
05/24/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/696,045	COFFEY, JOHN T.
	Examiner	Art Unit	
	Phuong Phu	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *24 April 2007*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-4,6-10,12 and 14-18* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-4,6-10,12 and 14-18* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail. Date _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

1.   This Office Action is responsive to the Amendment filed on 4/24/07. Accordingly,

claims 1-4, 6-10, 12 and 14-18 are currently pending; and claims 5, 11, 13 and 19 are canceled.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

3.   Claim 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for

omitting essential elements, such omission amounting to a gap between the elements. See MPEP

§ 2172.01.

Claim 16 omits structural/functional cooperative relationships of element "host logic",

"means for transmitting symbols", "means for varying the number of data symbols" and

"antenna" to one another for making the claimed wireless device as a completely connective and

operative device.

Claims, depended on claim 16, are therefore also rejected.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
> in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
> patent by another filed in the United States before the invention by the applicant for patent, except that an
> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
> subsection of an application filed in the United States only if the international application designated the United
> States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 12, 14 and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Ma

et al (2003/0072254), newly-cited.

-Regarding to claim 12, see figures 2 and 5, and [0061-0064, 0071-0076], Ma et al

discloses a method (see figure 2), comprising:

procedure (comprising (12, 14, 22, 24, 26, 28)) (see figure 2) of determining a number of

data tones to include in a symbol, which may comprise of both data tones (124) and pilot tones

(126 or 128) or merely comprises of data tones (124) (see figure 5);

procedure (comprising (24, 26, 28)) of forming the symbol with the determined number

of data tones;

procedure (comprising (36, 37)) of transmitting the symbol; and

procedure (comprising (24, 23)) of changing the number of data tones to form another

symbol, e.g., changing the number of data tones of a symbol merely comprising of 16 data tones

to form another symbol comprising of 12 data tones and 4 pilot tones (see figure 5),

wherein the number of data tones comprises either a first number (=16) of data tones or a

second number (=12) of data tones (see figure 5).

-Regarding to claim 14, Ma et al discloses procedure (comprising (24, 23)) of varying a

number of pilot tones for generating symbols merely comprising of 16 data tones and zero pilot

tones or symbols comprising of 12 data tones and 4 pilot tones (see figure 5).

-Regarding to claim 16, as similarly applied to claims 12 and 14 set forth above and

herein incorporated, see figures 2 and 5, and [0061-0064, 0071-0076], Ma et al discloses a

wireless device (see figure 2) comprising:

host logic (12, 14) (see figure 2);

an antenna (37) (see figure 2);

means (comprising (36, 37)) (see figure 2) for transmitting symbols containing a plurality

of data tones; and

means (comprising (24, 23)) (see figure 2) for varying the number of data tones so as to

comprise either a first number (=16) of data tones or a second number (=12) of data tones (see

figure 5).

-Claim 17 is rejected with similar reasons set forth for claim 14.

-Regarding to claim 18, Ma et al discloses procedure/means of inserting pilot tones in a

symbol for varying the number of data tones in the symbol can be instructed to be carried out via

software (see [0103]) wherein the software inherently is inherently created and provided by at

least a person. As such, it can be said that Ma et al teaches said means of inserting pilot tones,

(considered here equivalent with the limitation "means for varying the number of data tones"),

for varying the number of data tones accordingly to the software, (considered here equivalent

with the limitation "user input").

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   Claims 1-4, 6-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Ma et al.

-Regarding to claim 15, Ma et al does not teach that forming the symbol comprises including 48 data tones and 4 pilot tones and varying the number of data tones comprises including 52 data tones and the method further comprises including no pilot tones with the 52 data tones, as claimed.

However, Ma et al teaches that symbols can be generated for forming a diamond lattice pilot pattern, in which each pilot tone "encoded pilot symbol" is inserted within an OFDM frame, in such a way that each pilot tone is inserted at each of a first subset of tones "first subset of frequencies". The tones "frequencies" within the first subset of tones are spaced equally apart by a pilot spacing. The pilot tone is inserted at each of the first subset of tones for an a block of two symbols "STBC block". At some later time, the pilot tones are inserted at each of a second subset of tones "second subset of frequencies". The tones "frequencies" within the second set of tones are shifted from the tones within the first subset of tones by half of the pilot spacing within the frequency direction. The insertion is continued alternating between the first subset of tones and the second subset of tones. Ma et al further teaches that a different pilot pattern can be used as long as the same pilot pattern is used for each of each of at least one pilot tone, and as long as the pilot patterns for the pilot tones are offset from each other in the time direction of the OFDM frame, (see [0072, 0073]).

Based upon Ma et al teaching, it would have been obvious for one skilled in the art to implement Ma et al invention in such a following way: symbols, each comprising of 52 tones, can be generated for forming a diamond lattice pilot pattern, in which each pilot tone is inserted within an OFDM frame comprising of 24 symbols, in such a way that for a symbol, each of 4 pilot tones is inserted at each of a first subset of tones (1st tone, 15th tone, 29th tone and 43th tone),

respectively, and the rest of the symbol are data tones; the tones within the first subset of tones

are spaced equally apart by a pilot spacing of 14 data tones; the pilot tone is inserted at each of

the first subset of tones for a block of two symbols; at some later time of 4 symbols apart,

wherein each of said 4 symbols comprises of 52 data tones and no pilot tones, the pilot tones are

inserted at each of a second subset of tones ($8^{th t}$ tone, 22th tone, 36th tone and 50th tone); the

tones within the second set of tones are shifted from the tones within the first subset of tones by

half of the pilot spacing within the frequency direction; and the insertion is continued alternating

between the first subset of tones and the second subset of tones, so that such the implementation

would become another Ma et al embodiment.

With such the implementation, it can be said that Ma et al teaches forming the symbol

comprises including 48 data tones and 4 pilot tones and varying the number of data tones

comprises including 52 data tones and the method further comprises including no pilot tones

with the 52 data tones, as claimed.

-Regarding to claim 1, as similarly applied to claims 12, 14 and 15-18 set forth above and

herein incorporated, Ma et al discloses a wireless device (see figure 2), comprising:

host logic (comprising (12, 14));

network interface logic (comprising (22, 23, 24)) coupled to the host logic for receiving

data from the host logic; and

an antenna (37);

wherein the network interface logic formats packets "OFDM frame" for transmission via

the antenna, the packets comprising symbols containing a plurality of data tones and

wherein the network interface logic varies the number of data tones for inserting pilot

tones within a symbol of a packet, so as to comprise either a first number(e.g., =16) of data tones

or a second number (e.g., =12) of data tones (see figure 5); and wherein the first number is

greater than the second number .

Ma et al does not teach that more symbols per packet are transmitted by the network

interface logic having the first number of data tones, as claimed.

However, Ma et al teaches that symbols can be generated for forming a diamond lattice

pilot pattern, in which each pilot tone "encoded pilot symbol" is inserted within an OFDM

frame, in such a way that each pilot tone is inserted at each of a first subset of tones "first subset

of frequencies". The tones "frequencies" within the first subset of tones are spaced equally apart

by a pilot spacing. The pilot tone is inserted at each of the first subset of tones for an a block of

two symbols "STBC block". At some later time, the pilot tones are inserted at each of a second

subset of tones "second subset of frequencies". The tones "frequencies" within the second set of

tones are shifted from the tones within the first subset of tones by half of the pilot spacing within

the frequency direction. The insertion is continued alternating between the first subset of tones

and the second subset of tones. Ma et al further teaches that a different pilot pattern can be used

as long as the same pilot pattern is used for each of each of at least one pilot tone, and as long as

the pilot patterns for the pilot tones are offset from each other in the time direction of the OFDM

frame, (see [0072, 0073]).

Based upon Ma et al teaching, it would have been obvious for one skilled in the art to

implement Ma et al network interface logic in such a following way: symbols, each comprising

of 52 tones, can be generated for forming a diamond lattice pilot pattern, in which each pilot tone

is inserted within an OFDM frame comprising of 24 symbols, in such a way that for a symbol, each of 4 pilot tones is inserted at each of a first subset of tones (1st tone, 15th tone, 29th tone and 43th tone), respectively, and the rest (= 48 tones) of the symbol are data tones; the tones within the first subset of tones are spaced equally apart by a pilot spacing of 14 data tones; the pilot tone is inserted at each of the first subset of tones for a block of two symbols; at some later time of 4 symbols apart, wherein each of said 4 symbols comprises of 52 data tones and no pilot tones, the pilot tones are inserted at each of a second subset of tones (8$^{th\ t}$ tone, 22th tone, 36th tone and 50th tone); the tones within the second set of tones are shifted from the tones within the first subset of tones by half of the pilot spacing within the frequency direction; and the insertion is continued alternating between the first subset of tones and the second subset of tones, so that such the implementation would become another Ma et al embodiment.

With such the implementation, it can be said that Ma et al teaches the claimed wireless device in which the network interface logic is configurable to format packets "OFDM frame"s for transmission via the antenna, the packets comprising symbols containing a plurality of data tones and wherein the network interface logic varies the number of data tones for inserting pilot tones within a symbol of a packet "OFDM frame", so as to comprise either a first number (=52) of data tones or a second number (=48) of data tones; wherein the first number is greater than the second number; and wherein more symbols (=16 symbols) per packet "OFDM frame" are, therefore, transmitted by the network interface logic having the first number (=52) of data tones than symbols (=8 symbols) transmitted by the network interface logic having the second number (=48) of data tones, as claimed.

-Regarding to claim 2, as applied to claim 1, Ma et al teaches that some symbols transmitted by the network interface logic comprise pilot tones that are used to facilitate demodulation and other symbols do not have pilot tones (see further figure 3, [0067]).

-Regarding to claim 3, as applied to claim 1, Ma et al teaches that some symbols comprise 48 data tones and 4 pilot tones and other symbols comprise 52 data tones and no pilot tones.

-Claim 4 is rejected with similar reasons set forth for claim 18.

-Regarding to claim 6, as similarly applied to claims 1-4, 12, 14 and 15-18 set forth above and herein incorporated, Ma et al discloses a wireless network (see figures 2 and 3), comprising:

a first wireless device (see figure 2);

a second wireless device (see figure 3) configured to communicate with the first wireless device;

wherein the first wireless device transmits to the second wireless device packets containing symbols containing a variable number of data tones so as to comprise either a first number of data tones or a second number of data tones, and wherein the first number is greater than the second number.

Ma et al does not teach that more symbols per packet are transmitted by the first wireless device having the first number of data tones, as claimed.

However, Ma et al teaches that symbols can be generated for forming a diamond lattice pilot pattern, in which each pilot tone "encoded pilot symbol" is inserted within an OFDM frame, in such a way that each pilot tone is inserted at each of a first subset of tones "first subset

of frequencies". The tones "frequencies" within the first subset of tones are spaced equally apart

by a pilot spacing. The pilot tone is inserted at each of the first subset of tones for an a block of

two symbols "STBC block". At some later time, the pilot tones are inserted at each of a second

subset of tones "second subset of frequencies". The tones "frequencies" within the second set of

tones are shifted from the tones within the first subset of tones by half of the pilot spacing within

the frequency direction. The insertion is continued alternating between the first subset of tones

and the second subset of tones. Ma et al further teaches that a different pilot pattern can be used

as long as the same pilot pattern is used for each of each of at least one pilot tone, and as long as

the pilot patterns for the pilot tones are offset from each other in the time direction of the OFDM

frame, (see [0072, 0073]).

Based upon Ma et al teaching, it would have been obvious for one skilled in the art to

implement Ma et al wireless network in such a following way: symbols, each comprising of 52

tones, can be generated for forming a diamond lattice pilot pattern, in which each pilot tone is

inserted within an OFDM frame comprising of 24 symbols, in such a way that for a symbol, each

of 4 pilot tones is inserted at each of a first subset of tones (1st tone, 15th tone, 29th tone and 43th

tone), respectively, and the rest (= 48 tones) of the symbol are data tones; the tones within the

first subset of tones are spaced equally apart by a pilot spacing of 14 data tones; the pilot tone is

inserted at each of the first subset of tones for a block of two symbols; at some later time of 4

symbols apart, wherein each of said 4 symbols comprises of 52 data tones and no pilot tones, the

pilot tones are inserted at each of a second subset of tones (8$^{th\ t}$ tone, 22th tone, 36th tone and 50th

tone); the tones within the second set of tones are shifted from the tones within the first subset of

tones by half of the pilot spacing within the frequency direction; and the insertion is continued

alternating between the first subset of tones and the second subset of tones, so that such the implementation would become another Ma et al embodiment.

With such the implementation, it can be said that Ma et al teaches the claimed wireless network in which the first wireless device is configurable to format packets "OFDM frame"s for transmission, the packets comprising symbols containing a plurality of data tones and wherein the first wireless device varies the number of data tones for inserting pilot tones within a symbol of a packet "OFDM frame", so as to comprise either a first number (=52) of data tones or a second number (=48) of data tones; wherein the first number is greater than the second number; and wherein more symbols (=16 symbols) per packet "OFDM frame" are, therefore, transmitted by the first wireless device having the first number (=52) of data tones than symbols (=8 symbols) transmitted by the first wireless device having the second number (=48) of data tones, as claimed.

-Regarding to claim 7, Ma et al does not teach that second wireless device transmits to the first wireless device packets containing symbols containing a variable number of data tones, as claimed.

However, as applied to claim 6, Ma et al teaches that that first wireless device transmits to the second wireless device packets containing symbols containing a variable number of data tones. Ma et al further teaches that the invention is for communications systems (see [0002]) and other arrangements and methods can be implemented to the invention by those skilled in the art (see [0104]).

It would have been obvious for one skilled in the art to implement Ma et al in such a way that the second wireless device would be additionally implemented to transmit to the first

wireless device packets containing symbols containing a variable number of data tones, as similar to Ma et al teaching for the first wireless device, so that with such the implementation, the wireless network would be enhanced with a 2-way communications between the first wireless device and second wireless device.

-Claim 8 is rejected with similar reasons set forth for claim 2.

-Claim 9 is rejected with similar reasons set forth for claim 3.

-Claim 10 is rejected with similar reasons set forth for claim 18.

Response to Arguments

8.   Applicant's arguments filed on 4/24/07 have been fully considered but they are persuasive. The previous rejections have been withdrawn. However, claims 1-4, 6-10, 12 and 14-18 are deemed not allowable because of reasons set forth above in this Office Action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Phu whose telephone number is 571-272-3009. The examiner can normally be reached on M-F (8:00 AM - 4:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phuong Phu
Primary Examiner
Art Unit 2611

Phuong Phu
05/06/07

PHUONG PHU
PRIMARY EXAMINER